

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) An image forming apparatus, comprising:
a developer cartridge containing a toner and detachably mountable into an apparatus main body;
a cartridge storage means for saving intrinsic information including information on the life of the developer cartridge provided in the developer cartridge; and
a first main-body controlling means for writing improper detachment information for making an improper detachment of said developer cartridge from the apparatus main body recognizable in said cartridge storage means.
2. (Original) An image forming apparatus according to claim 1, wherein said first main-body controlling means writes the improper detachment information in said cartridge storage means of said developer cartridge at the time of mounting said developer cartridge into the apparatus main body.
3. (Original) An image forming apparatus according to claim 2, wherein said first main-body controlling means reads information written in said cartridge storage means of said developer cartridge at the time of mounting said developer cartridge into the apparatus main body to judge whether or not the improper detachment information is written, and writes the improper detachment information in said cartridge storage means when it is judged that the improper detachment information is not written.
4. (Original) An image forming apparatus according to claim 3, wherein said first main-body controlling means executes an abnormality processing when judging that the improper detachment information is written in said cartridge storage means of said mounted developer cartridge.

5. (Original) An image forming apparatus according to claim 3, further comprising:

a main-body storage means provided in the apparatus main body; and

a life calculating means for calculating a life value corresponding to a remaining amount of the toner in said developer cartridge and renewably saving the calculated life value in said main-body storage means,

wherein

said first main-body controlling means reads at least the information on the life written in said cartridge storage means and writes it in said main-body storage means when judging that the improper detachment information is not written in said cartridge storage means, and

said life calculating means calculates an added value of values corresponding to an amount of toner consumed at every image forming operation and calculates the life value based on the calculated added value

and the information on the life written in said main-body storage means.

6. (Original) An image forming apparatus according to claim 5, further comprising:

a cartridge supporting means which is movable relative to the apparatus main body and into which at least one developer cartridge is mountable;

a driving means for driving said cartridge supporting means to position said cartridge supporting means at least to a specified detachment position and a specified reading/writing position; and

a drive controlling means for controlling the operation of said driving means to control the positioning of said cartridge supporting means,

wherein

the detachment position is such a position where said developer cartridge can be detached through a developer cartridge opening formed in the apparatus main body,

the reading/writing position is such a position where the reading and writing from and in said cartridge storage means by said first main-body controlling means are possible,

upon a detachment instruction to detach said developer cartridge from the apparatus main body, said first main-body controlling means reads the information written in said cartridge storage means of said developer cartridge to judge whether or not the improper detachment information is written, and executes a detachment preparation during which the life value is written in said cartridge storage means as the information on the life and the improper detachment information is cleared when it is judged that the improper detachment information is written, and

said drive controlling means first positions said cartridge supporting means to the reading/writing position upon the detachment instruction and then positions said cartridge supporting means to the detachment position after the completion of the detachment preparation by said first main-body controlling means.

7. (Original) An image forming apparatus according to claim 6, wherein said first main-body controlling means executes an abnormality processing when it is judged that the improper detachment information is not written in said cartridge storage means of said developer cartridge to be detached.

8. (Original) An image forming apparatus according to claim 6, further comprising a cover for closing the developer cartridge opening, wherein said driving means stops driving said cartridge supporting means when said cover is opened.

9. (Original) An image forming apparatus according to claim 6, wherein said cartridge supporting means is so constructed as to rotate said developer cartridge about an axis of rotation substantially normal to an opening plane of the developer cartridge opening.

10. (Original) An image forming apparatus according to claim 6, further comprising:

- a cover for closing the developer cartridge opening; and
- a detecting means for detecting open and closed states of said cover,

wherein said drive controlling means judges that said developer cartridge has been mounted into the apparatus main body when said cover is detected to have been closed after being opened with said cartridge supporting means located at the detachment position after the completion of the detachment preparation.

11. (Original) An image forming apparatus according to claim 1, wherein said first main-body controlling means reads information written in said cartridge storage means of said developer cartridge to judge whether or not the improper detachment information is written when a predetermined storage controlling condition is satisfied with said developer cartridge mounted in the apparatus main body, and writes the improper detachment information in said cartridge storage means when it is judged that the improper detachment information is not written.

12. (Original) An image forming apparatus according to claim 11, wherein the storage controlling condition is satisfied when the apparatus is turned on.

13. (Original) An image forming apparatus according to claim 11, wherein the storage controlling condition is satisfied when the number of prints made reaches a predetermined value.

14. (Original) An image forming apparatus according to claim 11, wherein the storage controlling condition is satisfied when a print command signal is inputted from an external apparatus.

15. (Original) An image forming apparatus according to claim 11, further comprising:

a main-body storage means provided in the apparatus main body; and

a life calculating means for calculating a life value corresponding to a remaining amount of the toner in said developer cartridge and renewably saving the calculated life value in said main-body storage means,

wherein said first main-body controlling means saves at least the information on the life written in said cartridge storage means in said main-body storage means when it is judged that the improper detachment information is not written in said cartridge storage means, and

said life calculating means calculates an added value of values corresponding to an amount of toner consumed at every image forming operation and calculates the life value based on the calculated added value

and the information on the life saved in said main-body storage means.

16. (Original) An image forming apparatus according to claim 15, further comprising:

a cartridge supporting means which is movable relative to the apparatus main body and into which at least one developer cartridge is mountable;

a driving means for driving said cartridge supporting means to position said cartridge supporting means at least to a specified detachment position and a specified reading/writing position; and

a drive controlling means for controlling the operation of said driving means to control the positioning of said cartridge supporting means,

wherein

the detachment position is such a position where said developer cartridge can be detached through a developer cartridge opening formed in the apparatus main body,

the reading/writing position is such a position where the reading and writing from and in said cartridge storage means by said first main-body controlling means are possible,

upon a detachment instruction to detach said developer cartridge from the apparatus main body, said first main-body controlling means executes a detachment preparation of updating the information on the life saved in said cartridge storage means of said developer cartridge to the life value renewably saved in said main-body storage means, and of clearing the improper detachment information, and

said drive controlling means first positions said cartridge supporting means to the reading/writing position upon the detachment instruction and then positions

said cartridge supporting means to the detachment position after the completion of the detachment preparation by said first main-body controlling means.

17. (Original) An image forming apparatus according to claim 16, wherein said first main-body controlling means reads the information written in said cartridge storage means of said mounted developer cartridge to judge whether or not the improper detachment information is written when said developer cartridge is mounted into the apparatus main body, and executes an abnormality processing when it is judged that the improper detachment information is written.

18. (Original) An image forming apparatus according to claim 16, further comprising a cover for closing the developer cartridge opening, wherein said driving means stops driving said cartridge supporting means when said cover is opened.

19. (Original) An image forming apparatus according to claim 16, wherein said cartridge supporting means is so constructed as to rotate said developer cartridge about an axis of rotation substantially normal to an opening plane of the developer cartridge opening.

20. (Original) An image forming apparatus according to claim 16, further comprising:

a cover for closing the developer cartridge opening; and

a detecting means for detecting open and closed states of said cover,

wherein said drive controlling means judges that said developer cartridge was mounted into the apparatus main body upon detecting that said cover was closed after being opened with said cartridge supporting means positioned at the detachment position after the completion of the detachment preparation, and positions said cartridge supporting means to the reading/writing position.

21. (Original) A method for controlling the storage of information on an improper detachment of a developer cartridge in an image forming apparatus in which a developer cartridge containing a toner is detachably mountable into an apparatus main body and a cartridge storage means for saving intrinsic information

including information on the life of said developer cartridge is provided in said developer cartridge, said method comprising the steps of:

writing improper detachment information for making the improper detachment of said developer cartridge from the apparatus main body recognizable in said cartridge storage means; and

clearing the improper detachment information written in said cartridge storage means upon a detachment instruction to detach said developer cartridge from the apparatus main body.

22. (Original) A method according to claim 21, wherein said step of writing the improper detachment information in said cartridge storage means is performed at the time of mounting said developer cartridge into the apparatus main body.

23-50. (Canceled)